

REMARKS

This Amendment is responsive to the Final Office Action mailed July 10, 2009 ("Office Action").

Claim Amendments

Claims 9 and 16 have been amended to further describe the cooling jacket. These amendments are consistent with the specification and do not add new matter, see Paragraph 007.

In addition, claims 15 and 21 have been amended to be consistent with the amendments to claims 9 and 16. No new matter is introduced by these amendments.

Claim Rejections – 35 USC § 103

Claims 9-12, 14-18, and 20-23 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Nakagawa et al. (US 6,024,774) ("Nakagawa").

In addition to the arguments previously presented and hereby incorporated by reference, Applicants present the following arguments. Amended claims 9 and 16 of the present invention recite "a cooling jacket containing a circulating coolant surrounding the catalyst bed for maintaining the oxidation reactor operating temperature from about 90°C to about 180°C." According to the present invention, the "cooling jacket should contain a circulating coolant that can be water, steam, or air, or, in one illustrative embodiment, the hydrocarbon fuel feed to the fuel processor for energy efficiency." (Paragraph 0007.) Further, the cooling jacket is depicted in Figure 2 as follows: "By using a cooling jacket 230 containing water, steam, air, or a cool hydrocarbon fuel feed stream, reactor 200 can be maintained in the desired operating temperature range of from about 90° C. to about 180° C." (Paragraph 0037.)

According to the Examiner, Nakagawa discloses "a cooling jacket (7) for maintaining the reactor operating temperature." (Office Action, p. 2.) However a review of Nakagawa reveals that Nakagawa states as follows: "The coolant circulation pipe 7, that is, cooling means serves to control the temperature of the reaction site such that it does not exceed the suitable temperature for the above reactions between carbon monoxide and water, and lithium zirconate, since these reactions are of heat-generating type. It should be noted here that the cooling means is not limited to the circulation pipe, but a fin tube, that is, a spiral coolant circulation tube equipped with a plurality of disk-like fins piercing through them, may be arranged in the inner tube 2." (Column 4, lines 26-34.) Further, Nakagawa's coolant circulation pipe 7 is depicted in Figure 1.

Applicants respectfully assert that both the excerpts from the specifications and the figures illustrate Nakagawa does not disclose the "cooling jacket containing a circulating coolant" of the present invention. As a result, claims 9-12, 14-18, and 20-23 are not unpatentable over Nakagawa. Reconsideration and withdrawal of the rejection is respectfully requested.

Claims 9, 12, 15, 16, 21, and 23 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Clawson et al. (US 6,641,625).

In addition to the arguments previously presented and hereby incorporated by reference, Applicants present the following arguments. Amended claims 9 and 16 of the present invention recite "a cooling jacket containing a circulating coolant surrounding the catalyst bed for maintaining the oxidation reactor operating temperature from about 90°C to about 180°C." According to the present invention, the "cooling jacket should contain a circulating coolant that can be water, steam, or air, or, in one illustrative embodiment, the hydrocarbon fuel feed to the fuel processor for energy efficiency." (Paragraph 0007.) Further, the cooling jacket is depicted in Figure 2 as follows: "By using a cooling jacket 230 containing water, steam, air, or a cool hydrocarbon fuel feed stream, reactor 200 can be maintained in

the desired operating temperature range of from about 90° C. to about 180° C.” (Paragraph 0037.)

According to the Examiner, Clawson discloses “a cooling jacket (97) for maintaining the reactor operating temperature (Fig. 1).” (Office Action, p. 4.) However a review of Clawson reveals that Clawson states as follows: “The PrOx reactor 13 of the preferred system comprises a means for actively cooling the catalyst within the second zone 94. A preferred means is shown in FIG. 13. Water/steam tube 97, double-helically configured throughout the catalyst bed 95, provides a continuous heat exchange with the catalyst bed 95. That is, a flow of water from a convenient source is pumped continuously into the tube 97 through the water inlet 86 of the PrOx reactor 13. The cooling fluid flows through the water/steam tube 97 drawing heat from the catalyst bed 95, which is in contact with the water/steam tube 97, and discharging from the reactor 13 at the water outlet 87. The water/steam tube 97 is preferably made from a very good conductive, but non-reactive metal, such as 304 SS, to further assist in the heat exchange. It should be understood that several other boiler tube arrangements would be suitable for actively cooling the catalyst bed including, but not limited to, single-helical, longitudinal, and any other configuration which results in the boiler tubes being interspersed throughout the second zone 94 or catalyst bed 95. It should also be understood that the water/steam tube 97 may be extended into the first zone 91 to actively cool the reformat before it enters the second zone 94.” (Column 23, lines 46-64.) Further, Clawson’s tube 97 is depicted in Figure 13.

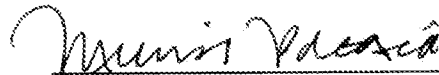
Applicants respectfully assert that both the excerpts from the specifications and the figures illustrate Clawson does not disclose the cooling jacket of the present invention. As a result, claims 9, 12, 15, 16, 21, and 23 are not unpatentable over Clawson. Reconsideration and withdrawal of the rejection is respectfully requested.

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Applicants respectfully request reconsideration of the obviousness rejection. This is believed to be a full and complete response to the outstanding Final Office Action mailed July 10, 2009. The present application is believed to be in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of the captioned application is respectfully requested.

Respectfully submitted,



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